

**DEPARTMENT OF TRANSPORTATION****DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 69.28**WELDING INSPECTION REPORT****Resident Engineer:** Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-004502**Date Inspected:** 23-Oct-2008**Project Name:** SAS Superstructure**OSM Arrival Time:** 1930**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 730**Contractor:** Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island **Location:** Shanghai, China**CWI Name:** Li Yan Hua, An Qing Xiang**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG, Tower**Summary of Items Observed:**

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China, to randomly monitor welding and Quality Control (QC) functions. While on site, the QA Inspector observed and/or discovered the following:

**OBG Sub-Assembly Shop – Bay 1**

Caltrans Quality Assurance (QA) Inspector, Ken Jobes, was present to monitor activities associated with the Production Monitoring Test (PMT) of Orthotropic Box Girder (OBG) Deck Panel U-rib welds. The PMT representing Deck Panels DP258-001 and DP423-001 was monitored. After MT of the tack welds was accepted by ZPMC Level II MT Technician, Wang Wei, the three ribs (six welds) were simultaneously welded to simulated deck plates in the horizontal groove (2G) welding position. The Welding Procedure Specification (WPS) used was WPS-B-T-2342-U1(Urib)-4. It is a combination procedure using gas metal arc welding (GMAW) for the root pass and submerged arc welding (SAW) for the cover or fill pass. The filler metals being used were verified to be as specified on the WPS; 1.4 mm diameter, ER70S-6 (JM-56) for GMAW and 4.8 mm diameter EH14K (H14) for SAW. During the test, the Caltrans QA Inspector recorded the parameters observed on the U-Ribs PMT Inspection Sheet, dated 10-24-08, for both welding processes. The name of the gantry operators and each of the welding operators' identification numbers were also recorded on the U-Ribs PMT Inspection Sheet. ZPMC Certified Welding Inspector (CWI), Li Yan Hua (07120701) and ABF QA Inspector Huang Wen Guang were present during welding.

The final weld was visually examined and accepted by ZPMC CWI, Li Yan Hua; and ABF QA Inspector Huang

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Wen Guang. All welds appeared to meet the specified visual examination acceptance criteria. After ultrasonic examination (UT) and acceptance by ZPMC Level II UT Technician, Tang Xing Shan, the Caltrans QA Inspector designated the locations for the required macro-etch specimens. All macro-etch specimens were prepared and found acceptable by ZPMC CWI, and ABF QA Inspector. The macro-etch specimens were then examined by the Caltrans QA Inspector and the depth of penetration on each measured and the results recorded on Caltrans Project 04-0120F4 SAS OBG Fabrication Macro Etch Log.

All above observations appeared to meet the requirements of the job specifications.

The QA Inspector also observed ZPMC MT Technician Wang Wei performing MT on tack welds on DP258-001. The examination was performed in one direction only with yoke across the tacks. Paragraph 6.7.6.4 of AWS D1. 5 requires two directions, approximately ninety degrees apart. The technician marked and ABF Inspector, Wang Zhen Hua, documented the following: Weld No. 1 had five cracks and no areas of lack of fusion (LOF). Weld No. 2 had one crack and one area of LOF. Weld No. 3 had four cracks and two areas of LOF. Weld No. 4 had one crack and one area of LOF. Weld No. 5 had no cracks and two areas of LOF. Weld No. 7 had no cracks and one area of LOF. Weld Nos. 6, 8, 9, and 10 had no cracks and no areas of LOF.

This examination does not appear to meet the requirements of the job specifications.

### Heavy Machinery (Tower) Shop 1

The Caltrans Inspector also observed the machine Flux Cored Arc Welding (FCAW) of vertical stiffeners A1 thru A4 to South Tower Skin Plate "A", Lift 2, in the horizontal groove welding position. WPS-B-T-2332-TC-P5-F was being used for this welding. Weld No. SSD1-SA164D/F-22 was being welded by Tao Qian (I. D. 040457). Weld No. SSD1-SA164D/F-21 was being welded by Zhu Zhong Yun (I. D. 057194). Weld No. SSD1-SA164D/F-29 was being welded by Jiang Zhou (I. D. 040261). Weld No. SSD1-SA164E/F-27 was being welded by Wang Gong Zhi (I. D. 050041). Weld No. SSD1-SA164D/F-30 was being welded by Jin Xiao Gang (I. D. 053474). Weld No. SSD1-SA164E/F-26 was being welded by Yu Yong Lai (I. D. 048378). The QA Inspector verified the qualifications of all six welders for the work being performed. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651) was monitoring this welding as were one ZPMC QC personnel and two ABF Inspectors.

The Caltrans QA Inspector randomly observed the machine Submerged Arc Welding (SAW) of fill passes on Weld No. SSD1-SA208A/D-2B, South Tower, Skin "D", Lift 2. The welding operator was Chen Hong Xia (I. D. No. 040460). The welding was in the flat groove (1G) position using Welding Procedure Specification (WPS) No. WPS-B-T-2221-B-U3c-S. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651) was present during this welding as was ABF QA Inspector, Li Nan. The QA Inspector verified the electrode as JW-3 (EM12K) and the diameter of the electrode as 4.0 mm.

The Caltrans QA Inspector randomly observed the machine Submerged Arc Welding (SAW) of fill passes on Weld No. SSD1-SA163A/D-2B, South Tower, Skin "B", Lift 2. The welding operator was Hua Gui Mei (I. D. 050295). The welding was in the flat groove (1G) position using Welding Procedure Specification (WPS) No. WPS-B-T-2221-B-U3c-S. Certified Welding Inspector (CWI), An Qing Xiang (CWI No. 07120651) was present

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during this welding as was ABF QA Inspector, Li Nan. The QA Inspector verified the electrode as JW-3 (EM12K) and the diameter of the electrode as 4.0 mm.

All above observations appeared to meet the requirements of the job specifications.

### Summary of Conversations:

As identified within the contents of this report.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Peter Dautermann (1500219953) China, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Jobes,Kenneth	Quality Assurance Inspector
<b>Reviewed By:</b>	Carreon,Albert	QA Reviewer

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